

REMARKS

I. Summary of the Examiner's Action

A. Objections

1. Drawing Objections

The Examiner objected to the drawings because the drawings were handwritten and unclear. The Examiner required drawings in compliance with 37 CFR 1.121(d).

2. Specification Objection

The Examiner objected to the disclosure because the abstract exceeds 150 words.

3. Claim Objections

The Examiner objected to claims 8 and 21 and required that "L" should be defined in the claim.

B. Claim Rejections

Claims 1, 2, 4, 6 – 8, 13 – 15, 17, 19 – 21 and 26 stand rejected under 35 U.S.C. § 102(b) as being anticipated by United States Patent Application Publication No. 2003/0043928 to Ling *et al.* (hereinafter "Ling" or "the Ling application").

Claims 3, 5, 16 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ling in view of United States Patent No. 6,634,007 to Koetter *et al.* (hereinafter “Koetter” or “the Koetter patent”).

Claims 9 – 12 and 22 – 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ling in view of United States Patent No. 4,574,252 to Slack *et al.* (hereinafter “Slack” or “the Slack patent”).

Claims 27 – 31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ling in view of United States Patent No. 4,718,066 to Rogard *et al.* (hereinafter “Rogard” or “the Rogard patent”).

These rejections are respectfully disagreed with, and traversed below.

II. Applicants’ Response – Objections

A. Drawing Objections

Applicants have included replacement sheets that contain formal versions of FIGS. 1 – 17. The formal versions of FIGS. 1 – 17 remedy the handwritten and unclear nature of the figures as submitted. Applicants respectfully request that the objection on this basis be withdrawn.

B. Specification Objection

Applicants have amended the abstract so that it contains 150 words or less.

Applicants respectfully request that the objection on this basis be withdrawn

C. Claim Objections

Applicants have amended claims 8 and 21 by defining "L" in the claims.

Applicants respectfully request that the objection on this basis be withdrawn.

III. Applicants' Response – Claim Rejections

A. Rejection of Claims 1, 2, 4, 6 – 8, 13 – 15, 17, 19 – 21 and 26
under 35 U.S.C. § 102(b)

Applicants reproduce claim 1 here (emphasis added):

1. A method to operate a digital signal receiver, comprising:
detecting the occurrence of a symbol degrading event for a received
signal;
inserting zero symbols into a received symbol stream at a position in
response to detection of the signal degrading event prior to de-
interleaving the received signal; and
error correction decoding the received symbol stream having the inserted
zero symbols.

Applicants respectfully submit that it is not seen where any of the art of record, whether taken singly or in combination, either describes or suggests the subject matter of claim 1.

Before discussing the rejection, Applicants reproduce the following description of an aspect of the invention from the application appearing at page 2, lines 1 – 8 and 17 - 24:

“Disclosed herein is a technique for obtaining improved performance of digital communications channels using Forward Error Correction (FEC) when operating over channels with block fading or burst jamming. The channel of interest typically involves jamming or severe signal attenuation (e.g., fading) over some number of contiguous symbols of the transmission. One suitable, but non-limiting application, is related to the severe signal attenuation case that involves wireless communications between a helicopter and a satellite. In this application the channel is periodically obstructed due to rotation of the helicopter blades, resulting in a periodic block fading channel.

* * *

In the preferred embodiment zero symbols are inserted into the received signal stream, prior to the FEC decoder, at times that are estimated or otherwise determined to correspond to periods of jamming or severe fading. The zero symbols effectively ‘erase’ the severely degraded symbols. It is assumed that the presence of the zero symbols is less detrimental to the operation of the FEC decoder than the presence of the severely degraded symbols, especially in that the channel interleaving/de-interleaving operations result in the zero symbols being temporarily distributed over a large block of received symbols.”

The portion of the Ling application appearing at paragraph [0030], lines 13 – 21 is not concerned with this subject matter:

“Erasures (e.g., zero value indicative) are then inserted by a depuncturer 159 for coded bits punctured at system 110. The depunctured values are then de-interleaved by a channel de-interleaver 160 and further decoded by decoder 162 to a data sink 164. The channel deinterleaving, de-puncturing and de-coding are complementary to the channel interleaving, puncturing, and encoding performed at the transmitter.”

These operations neither concern “detecting the occurrence of a symbol-degrading event for a received signal”, nor “inserting zero symbols into a received symbol stream in response to detection of the signal degrading event ...” as is required by claim 1. Rather, the operations relied upon by the Examiner are merely complementary operations performed at the receiver necessary to decode a received signal that has been encoded in a particular manner. Accordingly, the relied-upon operations of Ling, in particular, the insertion of zeros, have nothing to do with counteracting the effect of a symbol degrading event as in the case of Applicant’s claimed subject matter.

As a result, Applicants submit that claim 1 is patentable over any of the art of record, whether taken singly or in combination. Applicants therefore respectfully request that the rejection of claim 1 be withdrawn. Applicants likewise request that the rejection of independent claim 14 be withdrawn both for reasons similar to those set forth above with respect to claim 1 and for reasons having to do with claim 14’s independently recited features. Claims 2, 4, 6 – 8, 13, 15, 17, 19 – 21 and 26 are patentable as depending from allowable base claims.

B. Rejection of Claims 3, 5, 16 and 18
under 35 U.S.C. § 103(a)

Koetter does not remedy the above-identified deficiencies of Ling. Accordingly, Applicants submit that claims 3, 5, 16 and 18 are patentable over the art of record both for the foregoing reasons set forth with respect to claim 1 and for reasons having to do with their separately-recited features. Applicants therefore respectfully request that the rejection of claims 3, 5, 16 and 18 be withdrawn.

C. Rejection of Claims 9 – 12 and 22 – 25
under 35 U.S.C. § 103(a)

Slack does not remedy the above-identified deficiencies of Ling. Accordingly, Applicants submit that claims 9 – 12 and 22 – 25 are patentable over the art of record both for the foregoing reasons set forth above with respect to claim 1 and for reasons having to do with their separately-recited features. Applicants therefore respectfully request that the rejection of claims 9 – 12 and 22 – 25 be withdrawn.

D. Rejection of Claims 21 – 31
under 35 U.S.C. § 103(a)

Applicants reproduce claim 27 here (emphasis added):

27. A method to receive a signal that passes through a channel that is periodically obstructed by a rotating propeller blade, comprising:
detecting the occurrence of a fading condition due to obstruction
by the propeller blade;

in response to detecting the occurrence of the fading condition,
inserting zero symbols into a received symbol stream at the
receiver;
de-interleaving the received symbol stream having the inserted
zero symbols; and
decoding the received symbol stream having the inserted zero
symbols.

Applicants respectfully submit that the foregoing arguments presented with respect to claim 1 are equally applicable to claim 27. Further, Rogard neither remedies the above-identified deficiencies of the Ling patent nor discloses the subject matter relied upon by the Examiner.

In particular, as set forth above, the Ling patent inserts zeros as part of complementary decoding operations. Nowhere does Ling either describe or suggest inserting zeros in response to detecting the occurrence of a fading condition. Accordingly, Ling is not seen to disclose the subject matter for which it is relied upon by the Examiner.

In addition, Rogards is not seen to disclose “detecting the occurrence of a fading condition by the propeller blade”. The only portion of Rogard relied upon by the Examiner to describe or suggest this subject matter, which appears at column 1, lines 22 – 34, is reproduced here:

“In the case of a satellite to-earth station link, for which the invention is particularly suitable, the transmission of data is frequently affected by periods of fading or even complete interruption of communication (black-out). FIGS. 3 and 4 of the accompanying drawings, which represent the received signal displayed on the cathode screen of a spectrum analyzer, show typical examples of such disturbances: the signal of FIG. 3 corresponds to periodic fading such as may be produced by regularly spaced trees along which a receiver is driving; FIG. 4 corresponds to temporary fading caused by passing under a bridge which crosses a motorway.”

Applicant respectfully submits that neither this portion, nor any other portion, of Rogard either describes or suggests the above-emphasized portion of claim 27. In particular, Rogard neither describes nor suggests inserting zeros in the manner of Applicants' invention when a fading condition caused by propeller blades is detected.

As a result, Applicants submit that claim 27 is patentable over any of the art of record, whether taken singly or in combination. Applicants therefore respectfully request that the rejection of claim 27 be withdrawn. Applicants likewise request that the rejection of claims 28 – 29 be withdrawn as well since these claims depend from an allowable base claim. Independent claims 30 and 31 are patentable for reasons similar to those set forth above with respect to claim 27.

IV. Conclusion

Applicants submit that in light of the foregoing amendments and remarks the application is now in condition for allowance. Applicants therefore respectfully request that the outstanding rejections be withdrawn and that the case be passed to issuance.

Respectfully submitted,

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Date

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